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Phase Changes - Vaporization

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Phillip Gauldin**Subject taught:** Middle School Science 7**Grade Levels:** 7th**Topic:** Phase changes**Today's Lesson:** Vaporization**Time Frame:** one block period**Objectives:**

Students

- Observe vaporization of various liquids
- Obtain data from a demonstration
- Describe the vaporization process
- Graph demonstration data using a TI calculator
- Compare the vaporization of two liquids

Key Ideas and standards:

Key Idea 4- Energy exists in many forms, and when these forms change, energy is conserved.

Vaporization of a liquid requires energy to bring the liquid to boiling and energy to maintain boiling.

Materials:

Beakers, water, boiling chips, alcohol burners, alcohol, ring stand and clamps, thermometer, TI graphing calculator.

Description**Teacher role- instruction**

As an engagement, the following simulation will be presented to the classroom.

Smartboard – smartview temperature /ice /kinetic motion

Students will be instructed to work with a partner. Each pair will be given a worksheet (see attached) for the lesson. Pairs will briefly describe the simulation event in five sentences making key points or observations. A discussion of various opinions in the classroom will follow for comparison purposes.

The actual physical setup will be already setup and ready to go. A beaker of water will be heated up via alcohol burner with a thermometer clamped to a ring stand to observe temperature at various time intervals of 20 seconds. Select certain pairs to observe the temperature data and write down on a white board. The class will fill in their worksheet data table.

Upon completion, each pair will receive TI graphing calculator. Smartview will be shown on the overhead whiteboard. The students will be instructed to load the data table into the TI lists one and two.

Independent variable time will be located into list 1 for the x coordinate

Dependent variable temperature will be put into list 2 for the y coordinate

Students will use a line plot of the data as the teacher walks thru the instructional use of the calculator via Smartview. Students are then asked to fill in the remaining questions on the worksheet.

Repeat the exercise for the alcohol liquid and complete worksheet comparison questions.

Student role-

Students will watch the engagement simulation and answer questions on the handout. With a partner, students will observe the demonstration and fill in data tables and answer questions on the worksheet. With a TI calculator the students will work with their partner to enter the data and plot the graph. The pair will answer the questions on the worksheet. With a new liquid (alcohol), students will exchange roles on entering the data and plotting the graph.

(Worksheet for student work and step by step instruction is listed after the assessment form.)

Assessment and evaluation

5 points	3 to 4 points	1 to 2 points
Student completes entire worksheet with full responses to all questions and comparisons. Student is active with in the pair sharing information and contributing	Student completes approximately 75 % of the worksheet with partial answers to all questions. Student is at least communicating in the pair with possibly less interaction.	Student completes approximately 25 % of the worksheet with minimal answers to questions. Student is not engaged with their pair.

Name-

Date-

Vaporization Worksheet

Part 1- Simulation observations and key points-

Write a minimum of five sentences:

Part 2- Vaporization of Water

Data table

List 1 – time (s)	List 2 – temperature (deg.C)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	

Follow instructions to input the data into list 1 and list 2 of your calculator

Follow instruction to plot the graph of the data on your calculator

In the space below, draw a picture of the calculator graph.

Describe what is happening to the liquid in relation to the graph.

Part 3 - Vaporization of alcohol
Data table

List 1 – time (s)	List 2 – temperature (deg.C)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	

Follow instructions to input the data into list 1 and list 2 of your calculator
Follow instruction to plot the graph of the data on your calculator
In the space below, draw a picture of the calculator graph.

Describe what is happening to the liquid in relation to the graph.

Compare the two graphs and data tables